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PATENT SPECIFICATION

734,723



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COMPLETE SPECIFICATION

Spraying apparatus for Liquid Insecticides, Disinfectants,  
Fertilisers or the like

We, JOHN NEVILLE MORRIS, of 38, Carpenter Road, Edgbaston, in the City of Birmingham, 15, a British Subject, and RAYMOND LESLIE KENT, of Penn Cottage, Colleshill Road, Marston Green, in the City of Birmingham, a British Subject, do hereby declare the invention, for which we pray that a Patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention has for its object to provide in a convenient form an apparatus for producing a water spray mixed with a liquid insecticide, disinfectant, fertiliser, medicament or other liquid.

An apparatus in accordance with the invention comprises the combination of an outer and inner bottle for containing respectively water and the liquid to be mixed with a water stream, the inner bottle being deformable by pressure exerted on it by the water in the outer bottle, a passage for a water stream extending across one end of the bottles and terminating in or adapted for connection to a spraying nozzle, an orifice leading from the said passage to the water bottle, another orifice leading from the other bottle to the said passage, and a control valve in the said passage, the arrangement being such that the liquid to be mixed with the water stream is displaced from its bottle by the pressure of the water acting on it.

In the accompanying drawings:

Figure 1 is a part sectional side elevation of a spraying apparatus embodying the invention.

Figure 2 is a sectional side elevation and Figure 3 a part sectional plan of the upper part of the apparatus shown in Figure 1.

Referring to the drawings, the apparatus

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thus there shown comprises a metal or other bottle *a* for containing water, and a collapsible bellows-like bottle *b* made from rubber or rubber-like material for containing the liquid to be mixed with a water stream. These two bottles are detachably secured at their upper ends to a hollow fitting *c* on which is formed a hollow stem *d* which serves as a handle and to which a hose pipe can be attached for conveying water under pressure from a domestic supply system or other convenient source. In the fitting is formed a water passage which extends to a spraying nozzle *e*. Alternatively this passage may be connected to a nozzle by a length of flexible pipe. The said passage consists in part of a cylindrical bore *f* which contains a slidable valve *g*, the latter being secured to one end of a stem *h* which is loaded by a spring *i* and is operable by a thumb piece *k*.

One end of the valve co-operates with an annular seating *m* for controlling the flow of water from the stem *d* to the bore *f* and also (by way of a branch passage *n*, Figure 3) to an orifice formed by an axially adjustable throttle *o*, the latter being in screw thread connection with a bore *p* which may be closed at its outer end by a removable plug *q*. Water passing the throttle enters the bottle *a* through the orifice *r*.

The valve *g* has formed in it an axial bore *s* which is open to the bore *f* at its forward end and which is provided with inlet ports *t*. An orifice *u* is also provided leading from the bottle *b* to the bore *f*. When the valve is in its closed position the orifice *u* is isolated by packing rings *v* on the valve.

To facilitate filling of the water bottle, the above described fitting is also provided with an air vent *w* controlled by a finger operable plug *x* (Figure 3). Fill-

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ing of the bottle *b* is effected through the neck *y* of the fitting after removal of the plug *z*.

The mode of action of the apparatus is as follows:—

On opening the valve a stream of water flows through the valve and hence through the spraying nozzle. At the same time pressure is exerted on the water in the bottle *a*, causing it to compress the bottle *b* and so effect discharge of the liquid in the bottle *b* at a rate dependent on the setting of the throttle *o* and the size of the orifice *u*. This liquid mixes with the water in the bore *f* and is discharged with the water through the valve to the spraying nozzle.

By this invention an apparatus for spraying water mixed with another liquid is provided in a form which is of simple construction, is convenient in use, and enables the quantity of the added liquid to be closely regulated.

The invention is not, however, restricted to the example above described, as the details of construction may be varied, and instead of the particular valve illustrated in the drawings, any other equivalent valve may be provided.

The invention is intended for the use of more especially agriculturists, or horticulturists, or for the treatment of cattle or other live-stock with a disinfectant, or a medicated liquid, but it may be employed for other uses.

What we claim is:—

1. An apparatus for spraying a mixture of water and a liquid insecticide, disin-

fectant, fertiliser, medicament, or other liquid comprising the combination of an outer and inner bottle for containing respectively water and the liquid to be mixed with a water stream, the inner bottle being deformable by pressure exerted on it by the water in the outer bottle, a passage for a water stream extending across one end of the bottles and terminating in or adapted for connection to a spraying nozzle, an orifice leading from the said passage to the water bottle, another orifice leading from the other bottle to the said passage, and a control valve in the said passage, the arrangement being such that the liquid to be mixed with the water stream is displaced from its bottle by the pressure of the water acting on it.

2. An apparatus as claimed in Claim 1 comprising a fitting for attachment to the outer and inner bottle, the said fitting being adapted for the connection thereto of a hose-pipe, and being provided with a manually operable control valve, and also with a nozzle or a nozzle connection.

3. An apparatus as claimed in Claim 1, in which the orifice situated between the water passage and the water bottle is formed by an adjustable throttle.

4. An apparatus for spraying a mixture of water and liquid insecticide, disinfectant, fertiliser, medicament or other liquid, comprising the combination and arrangement of parts, substantially as described and as illustrated by the accompanying drawings.

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## PROVISIONAL SPECIFICATION

### Spraying apparatus for Liquid Insecticides, Disinfectants, Fertilisers or the like

We, JOHN NEVILLE MORRIS, of 38, Carpenter Road, Edgbaston, in the City of Birmingham, 15, a British Subject, and RAYMOND LESLIE KENT, of Penn Cottage, Coleshill Road, Marston Green, in the City of Birmingham, a British Subject, do hereby declare this invention to be described in the following statement:—

This invention has for its object to provide in a convenient form an apparatus for producing a water spray mixed with a liquid insecticide, disinfectant, fertilisers or the like.

An apparatus in accordance with the invention comprises the combination of two containers separated by a flexible diaphragm or other movable partition for containing respectively water and the

liquid to be mixed therewith, a water passage having therein a restriction or venturi throat adapted to set up a pressure difference in the said passage, a branch passage leading from the entrance side of the said orifice or throat to the water container, a second branch passage leading from the other container to the exit side of the said orifice or throat, and an adjustable valve for regulating the flow of water to the water container or of liquid from the other container.

In one example a hollow body part is divided into two compartments of substantially equal volume by a flexible diaphragm or other equivalent movable partition. In combination with this body part is provided a water passage adapted for connection at one end to a domestic

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water supply tap, or other source of water, under pressure, the other end being adapted for the attachment thereto of a spraying nozzle, the latter preferably having combined with it a control valve operable by a trigger. In this passage is provided a restricted orifice adapted to set up a pressure difference in the water flowing in the said passage. Alternatively the passage may be provided with a venturi throat. At the entrance side of the restriction, or to the restricted part of the passage leading to the water compartment, and at the other side of the said restriction, or to the restricted part of the throat, is provided another branch passage leading from the compartment containing the insecticide, disinfectant or other liquid to be mixed with the water.

An adjustable valve is provided for regulating the rate of flow of water through the first mentioned branch passage. Alternatively an adjustable regulating valve may be provided for regulating the rate of flow of liquid through the other branch passage.

The arrangement is such that the pressure of the water on the diaphragm or movable partition serves to displace liquid from the other compartment at a rate determined by the regulating valve. The water and other liquid are mixed in the water passage, and the mixture is subsequently discharged through the spraying nozzles.

If desired a valve operable by the diaphragm may be provided for automatically interrupting the flow of water after the liquid in the other compartment has been discharged. Also another valve may be provided for automatically closing the second mentioned passage when spraying is discontinued. For actuating this valve a second restricted orifice is provided in the water passage at a position between the first mentioned restriction or throat, and the outlet end of the passage. Also a flexible and spring-loaded diaphragm or piston is provided which at its opposite sides is subject to the differential liquid pressures at the opposite sides of the second orifice, the closure member of the valve being carried by the diaphragm or piston. The arrangement is such that when the water flow is interrupted, the spring acting on the diaphragm or piston moves the closure member to its closed position. When the water flow is resumed the closure member is moved by the water to its open position.

By this invention an apparatus for spraying water mixed with another liquid is provided in a form which enables the quantity of added liquid to be closely controlled in a simple and convenient manner. The invention is particularly intended for the use of agriculturalists, or horticulturalists, or for the treatment of cattle or other live-stock with a disinfectant or medicated liquid.

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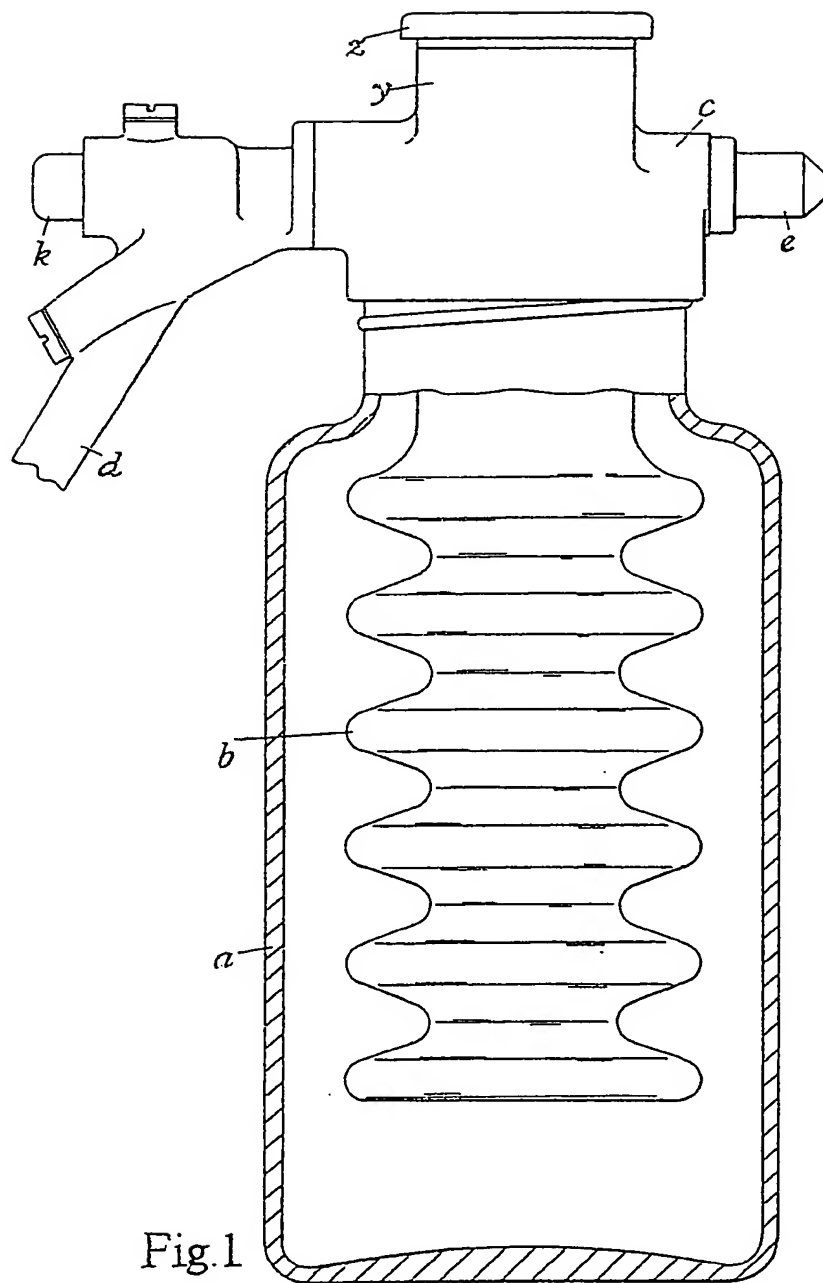


Fig.1

2 SHEETS

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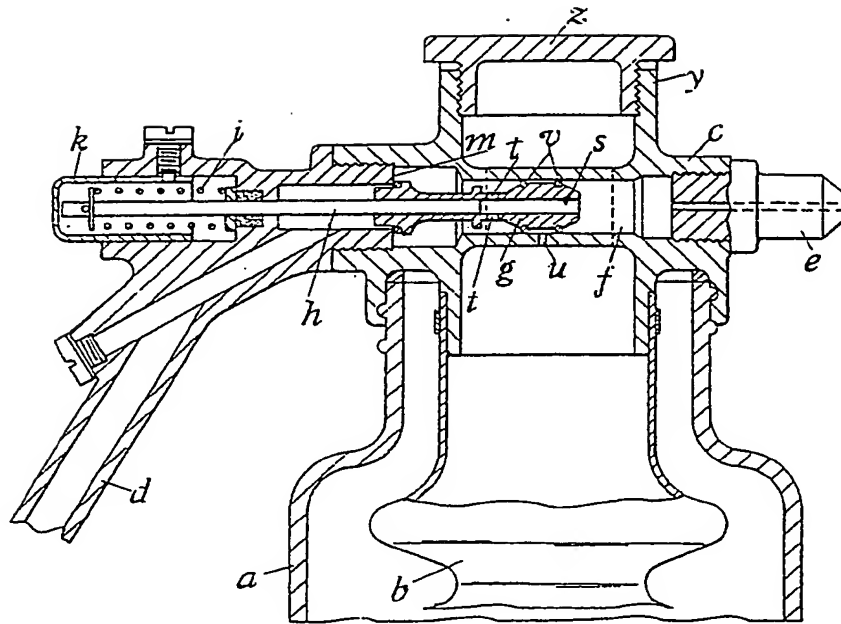


Fig.2

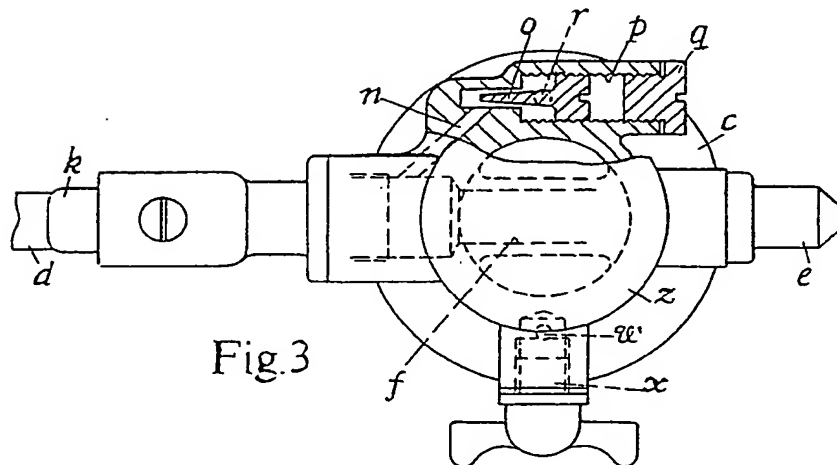


Fig.3

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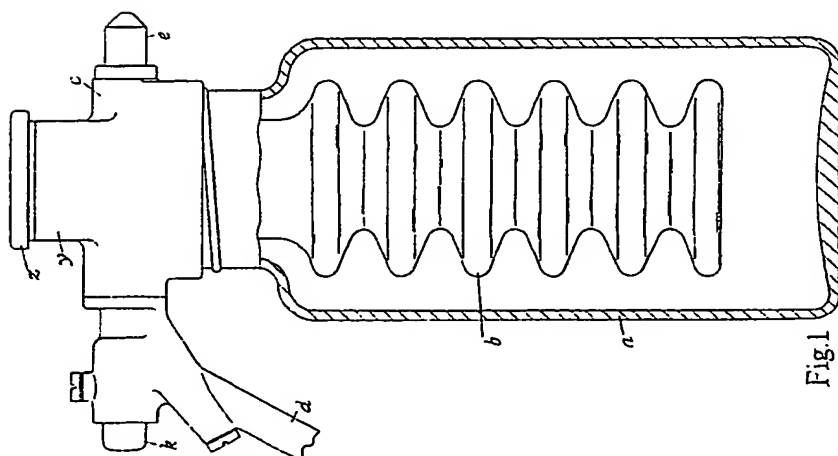


Fig.1

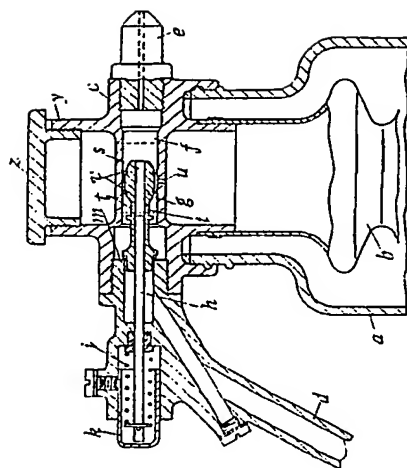


Fig.2

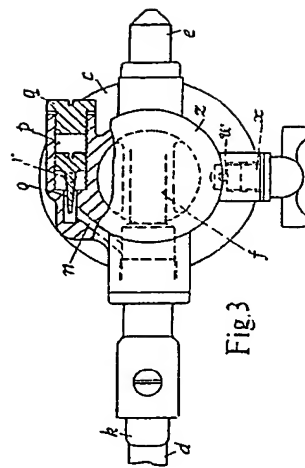


Fig.3